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A survey of ecto- and endo-parasites of domestic pigeons (*Columba livia*) in Mashhad, Iran

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Abstract

As there is no data available on parasite infection of pigeons (*Columba livia*) in the region, the present study was carried out on domestic pigeons in Mashhad city in the north-east of Iran. Three hundred specimens were examined for the presence of ecto and endoparasites. A total of 300 pigeons, %21.6(n=65) and %15.3(n=46) were infected with nematodes and cestodes respectively whereas no trematodes were found. The helminths and their prevalence were Nematoda: *Ascaridia columbae* (20.37%), *Capillaria bursata* (3.7%), *Capillaria caudinfillata* (1.85%), *Eulimdana clava* (2.7%), *Gongylonema spp* (0.9), Cestoda: *Choanotaenia infundibulum* (11.11%), *Raillietina echinobothrida* (6.48%). Six different species of ectoparasites: *Columbicloa columbae* (42.8%), *Pseudolynchia canariensis* (16.1%), *Menocanthus stramineus* (10.7%), *Menopon gallinae* (7.1%), Lipeurus *caponis* (5.3%), *Argas reflexus (*3.5%) and 2 haemoparasites species *Haemoproteus columbae (*50%) and *Leucocytozoon spp*. (2%) were identified. Further studies are recommended in assessing the effects of the parasites on the pigeons' health and production.

Keyword: Parasite, prevalence, *Columba livia*, Mashhad

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Introduction

Among the birds, importance of pigeons in relation to domestic chicken cannot be ignored, as pigeons act as reservoir host or carrier and an important source of infection for other avian host, which share the common parasitic fauna and sometimes harbor zoonotic parasites.

Domestic pigeons, like other domestic poultry, are also part of subsistence farming done by most poor families in Iran. However, little is known about the socio-economic importance, management and health of these birds. Because of noticed little importance of pigeons little attention in research has been directed towards the species in Iran. Besides, it envisaged that, understanding of parasitic diseases of pigeons will help in devising the measures to improve health and utility of these birds. This study was therefore designed to gauge the occurrence of parasites (endoparasites, ectoparasites) of pigeons in Mashhad in the north-east of Iran.

Materials and methods

Three hundred domestic pigeons (*Columba livia*) were collected from Mashhad town in the north-east of Iran between June 2009 and April 2010. This area is located at 36.208 latitude and 59.358 east longitude that sees about 250 mm of precipitation per year. After buying, pigeons were transported in cages to the parasitology section of faculty veterinary medicine of Ferdowsi university of Mashhad where they were examined, bled, humanely killed by cervical dislocation and investigation of parasites was performed.

The blood was collected from wing veins by using 2 ml syringe and the blood smears were prepared, air dried and fixed with Methanol and stained with Giemsa. The ectoparasites were collected as described by Soulsby (1986), briefly after killing the pigeons humanly, they were immediately placed in a polythene bag and the parasites collected after leaving the pigeons. The ectoparasites were preserved for identification purposes in 70% alcohol.

After euthanasia, the post-mortem examination was done and the abdominal and thoracic cavity were opened, followed by systemic autopsy examination which include, the oesophagus to the gizzard, the small intestine (duodenum, jejunum, and ileum), the caeca, and the ileocaeco-colic junction to the cloaca. Each section was opened longitudinally and the contents carefully washed through a 100 μM test sieve. The mucosa was scraped to collect the helminthes embedded in the mucosal layer. Finally, the contents were examined under stereomicroscope and all helminthes were fixed in 70% ethanol for further identification. All parasites were identified using the key Soulsby (1986) and Yamaguti (1961).

Results

A total of 300 pigeons, %21.6(n=65) and %15.3(n=46) were infected with nematodes and cestodes respectively whereas no trematodes were found. The helminths and their prevalence were Nematoda: *Ascaridia columbae* (20.37%), *Capillaria bursata* (3.7%), *Capillaria caudinfillata* (1.85%), Eulimdana *clava* (2.7%), *Gongylonema spp* (0.9), Cestoda: *Choanotaenia infundibulum* (11.11%), *Raillietina echinobothrida* (6.48%). Six different species of ectoparasites: *Columbicloa columbae* (42.8%), *Pseudolynchia canariensis* (16.1%), *Menocanthus stramineus* (10.7%), *Menopon gallinae* (7.1%), *Lipeurus caponis* (5.3%), *Argas reflexus (*3.5%) and 2 haemoparasites species *Haemoproteus columbae (*50%) and *Leucocytozoon spp*. (2%) were identified (Table 1).

Discussion

The present investigation showed 15 species of parasites which included 5 species of nematode, 2 species of cestodes, 6 species of ectoparasites and 2species of haemoparasites, making the first record of pigeon's parasites in Iran. Although majority of pigeons carried single worm species, mixed infection of up to two species were recorded and the total number of worms per bird ranged between 1 -50.

Table 1. Prevalence of helminthes and ecto parasites found in 300 domestic pigeons captured in Mashhad city in the northeast of Iran between April 2009 and June 2010.

parasites	species	Prevalence (%95CI)
Nematodes	*Ascaridia columbae*	20.37(15.82-24.92)
	Capillaria bursata	3.7(1.57-4-5.4)
	Capillaria caudinfillata	1.8(1.6-1.9)
	Eulimdana clava	2.7(2.55-2.88)
	Gongylonema spp	0.9(.8-1)
Cestodes	*Choanotaenia infundibulum*	11.11(7.55-14.61)
	Raillietina echinobothrida	6.48(3.73-9.18)
Arthropods	*Columbicloa columbae*	42.8 (37.21-48.3)
	pseudolynchia canariensis	16.1(11.94-20.25)
	Menacanthus stramineus	10.7(7.21-14.1)
	Menopon gallinae	7.1(4.2-10)
	Lipeurus caponis	5.3(5-5.6)
	Argus reflexus	3.5(3.2-3.8)

In present study, pigeons revealed %21.6and %15.3 were infected with nematodes and cestodes, respectively. These amounts in general is lower than reported from other west Asian countries such as Turkey (Senlik *et al*.,2005), Pakistan (Hayat *et al*,1999) and other countries such as Brussels (Bernard and Biesman, 1987), Yugoslavia (Kulisic, 1989), Spain (Martinez *et al*.,1989) Italy (Tacconi *et al*.,1993), Egypt (Ibrahim *et al*. (1995) and Tanzania (Msoffe *et al*.,2010). The low prevalence of helminth parasitism noted in this large sample of pigeons most likely are reflective of the pigeon's diet which consists mainly of fleshy fruits, acorns, grain and buds and flowers of deciduous shrubs and trees. Of interest is the observation that none of the infected pigeons was emaciated or be adversely affected by the light infections.

In present study, *Ascaridia columbae* and *Capillaria bursata* infection were 20.37 and 3.7%, respectively which is higher than Adang *et al* (2008) but lower than Borghare *et al*. (2009) and Ibrahim *et al* (1995). *A. columbae* is one of the common nematodes of pigeons which has been reported by a few workers from different parts of the world (Bernard and Biesman, 1987, Begum & Shaikh, 1987, Kulisic, 1989, Martinez *et al*. 1989, Tacconi *et al*. 1993, Ibrahim *et al*. 1995, Hayat *et al*. 1999, Mushi *et al*., 2000, Senlik *et al*., 2005, Msoffe *et al*., 2010). The worms were mainly found in small intestine but some were also found in gizzard lining or trapped in mesenteries as reported by Ali *et al*. (1985) and Wajihullah and Ansari (1986).

A. columbae, which are potentially pathogenic, worms were not shown to have clear physical effect on the health status of pigeons. Attempts to correlate the body condition with load of helminthes were not successful in the present study because data on performance of pigeons could not be got. However, the present study clearly showed that *A. columbae* is more parasitic condition in domestic pigeons in Mashhad and wherever control measures for endo parasites are in place these should be considered.

Similar to chickens and ducks, seasonal variations in the availability of free water could have limited exposure of pigeons to snails, which are carriers of trematodes, could partly explain their absence in this study (Muhairwa *et al*., 2007).

The present study showed that *A.columbae*, *H. columbae* and *Columbicloa columbae* were prevalent in domestic pigeons of Mashhad area and probably in other region of country. Mixed worm infections are less frequently seen than single worm infestations in pigeons. This

finding suggests that pigeons could be less susceptible to mixed infections in comparison with chickens. Whether these have more significant effect on the health and growth rate of these birds remains to be studied.

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بررسی انگل های داخلی وخارجی کبوتران اهلی (*Columba livia*) در مشهد، ایران

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چکیده

از آنجایی که اطلاعاتی در مورد عفونت های انگلی کبوتران اهلی در این ناحیه از کشور وجود ندارد، مطالعه حاضر بر روی کبوتران اهلی شهرستان مشهد واقع در شمال شرق ایران انجام شد. تعداد ۳۰۰ کبوتر به منظور بررسی انگل های داخلی و خارجی مورد مطالعه قرار گرفت. از مجموع ۳۰۰ قطعه کبوتر ۲۱.۶٪(تعداد=۶۵) و ۱۵.۳٪(تعداد=۴۶) نمونه ها به ترتیب آلوده به نماتودها و سستودها بودند این در حالی است که هیچ نمونه ای ازترماتود یافت نشد.آلودگی به نماتود ها و سستودها به ترتیب به شرح زیر بود: *آسکاریدیا کولومبه* (۲۰.۳۷)، *کاپیلاریا بورساتا*(۳.۷٪)، *کاپیلاریا کودین فلاتا* (۱.۸۵٪)، *اولیمدانا کلاوا*(۲.۷٪)، گونه های گونژیلونما(۰.۹٪)، *کوانوتنیا اینفاندیبولوم* (۱۱.۱۱٪) و *رایه تینا اکینوبوتریدا* (۶.۴۸٪). ۶ جنس مختلف از انگل های خارجی شامل *کولومبیکولا کولومبه* (۴۲.۸٪)، *سودولنشیا* (۱۶.۱٪)، *اومناکانتوس استرامینوس*(۱۰.۷)، *منوپون گالینه* (۷.۱٪)، *لیپوروس کاپونیس*(۵.۳٪)، *آرگاس رفلکسوس*(۳.۵٪) بود.تحقیقات بیشتربه منظور بررسی اثرات این انگل ها بر سلامتی و تولیدات کبوتران اهلی توصیه می شود.

واژگان کلیدی: انگل، شیوع، *Columba livia*، مشهد